

CLAIMS

1. An electrolytic capacitor, comprising:

an external casing;

5 a capacitor element enclosed in the external casing; and
a heat conductive material having heat conductivity of 1
W/m·K or more,

wherein the heat conductive material is disposed between
the external casing and the capacitor element so as to be in contact
10 with the external casing and the capacitor element.

2. The electrolytic capacitor as recited in claim 1,
wherein the heat conductive material having heat conductivity of
1 W/m·K or more is a heat conductive material in which one or more
15 kinds of particles selected from the group consisting of an alumina
particle, an aluminum nitride particle, a boron nitride particle
and a zinc oxide particle are dispersed in a matrix material.

3. The electrolytic capacitor as recited in claim 1,
20 wherein the heat conductive material having heat conductivity of
1 W/m·K or more is a heat conductive material in which alumina
particles are dispersed in a matrix material.

4. The electrolytic capacitor as recited in claim 2 or 3,
25 wherein an average particle diameter of the particle is 0.5 to
5µm.

5. The electrolytic capacitor as recited in claim 2 or 3, wherein a content rate of the particle in the heat conductive material is 70 mass% or more.

5 6. The electrolytic capacitor as recited in claim 2 or 3, wherein the matrix material is silicone oil and/or denatured silicone oil.

7. The electrolytic capacitor as recited in claim 2 or 3,
10 wherein a synthetic resin is used as the matrix material.

8. The electrolytic capacitor as recited in claim 7, wherein the synthetic resin is polyolefin.

15 9. The electrolytic capacitor as recited in claim 8, wherein the polyolefin is polypropylene and/or polyethylene.

10. The electrolytic capacitor as recited in any one of claims 1 to 3, wherein the heat conductive material is in contact
20 with the capacitor element by 30% or more of a height of the capacitor element.

11. The electrolytic capacitor as recited in any one of claims 1 to 3, wherein the external casing is made of aluminum.

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12. The electrolytic capacitor as recited in any one of claims 1 to 3, wherein the electrolytic capacitor is an aluminum

electrolytic capacitor.

13. The electrolytic capacitor as recited in any one of claims 1 to 3, wherein the capacitor element includes an anode foil, a cathode foil and a separator disposed between the anode foil and the cathode foil.

14. An electrolytic capacitor, comprising:
an external casing made of aluminum; and
10 a capacitor element enclosed in the external casing,
wherein an external peripheral surface of the external casing is covered with an insulation film.

15. The electrolytic capacitor as recited in claim 14,
15 wherein the insulation film is an aluminum oxide film.

16. The electrolytic capacitor as recited in claim 14,
wherein the insulation film is an aluminum nitride film.

20 17. An electrolytic capacitor, comprising:
an external casing made of aluminum; and
a capacitor element enclosed in the external casing,
wherein an external peripheral surface of the external casing is covered with an anodic oxide film formed by a surface
25 treatment.

18. An electrolytic capacitor, comprising:

an external casing made of aluminum; and
a capacitor element enclosed in the external casing,
wherein an external peripheral surface of the external
casing is covered with an aluminum nitride film formed by a surface
5 nitriding treatment.

19. The electrolytic capacitor as recited in any one of
claims 14 to 18, wherein a thickness of the film is 1 to 20 μ m.

10 20. The electrolytic capacitor as recited in any one of
claims 14 to 18, further comprising a heat conductive material
having heat conductivity of 1 W/m \cdot K or more disposed between the
external casing and the capacitor element so as to be in contact
with the external casing and the capacitor element.

15 21. The electrolytic capacitor as recited in claim 20,
wherein the heat conductive material having heat conductivity of
1 W/m \cdot K or more is a heat conductive material in which one or more
kinds of particles selected from the group consisting of an alumina
20 particle, an aluminum nitride particle, a boron nitride particle
and a zinc oxide particle are dispersed in a matrix material.

22. The electrolytic capacitor as recited in claim 20,
wherein the heat conductive material having heat conductivity of
25 1 W/m \cdot K or more is a heat conductive material in which alumina
particles are dispersed in a matrix material.

23. The electrolytic capacitor as recited in claim 21 or 22, wherein an average particle diameter of the particle is 0.5 to 5 μ m.

5 24. The electrolytic capacitor as recited in claim 21 or 22, wherein a content rate of the particle in the heat conductive material is 70 mass% or more.

10 25. The electrolytic capacitor as recited in claim 21 or 22, wherein the matrix material is made of silicone oil and/or denatured silicone oil.

15 26. The electrolytic capacitor as recited in claim 21 or 22, wherein a synthetic resin is used as the matrix material.

27. The electrolytic capacitor as recited in claim 26, wherein the synthetic resin is polyolefin.

20 28. The electrolytic capacitor as recited in claim 27, wherein the polyolefin is polypropylene and/or polyethylene.

25 29. The electrolytic capacitor as recited in any one of claims 20 to 22, wherein the heat conductive material is in contact with the capacitor element by 30% or more of a height of the capacitor element.

30. The electrolytic capacitor as recited in any one of

claims 14 to 18, wherein the electrolytic capacitor is an aluminum electrolytic capacitor.

31. The electrolytic capacitor as recited in any one of
5 claims 14 to 18, wherein the capacitor element includes an anode foil, a cathode foil and a separator disposed between the anode foil and the cathode foil.